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P.O. Journal, No.	1098



NEW ZEALAND

PATENTS ACT, 1953

No.:

DATE:

COMPLETE SPECIFICATION

"SEAL ON SACKS"

I/WE, FISO'S (PROPRIETARY) LIMITED, a company  
incorporated with limited liability under the  
laws of the Republic of South Africa, of Albatros  
House, Corner Marshall and West Streets, Johannesburg,  
Republic of South Africa,

hereby declare the invention for which ~~we~~<sup>XX</sup>/we pray that a patent may  
be granted to ~~me~~<sup>XX</sup>/us, and the method by which it is to be performed,  
to be particularly described in and by the following statement:—

THIS INVENTION relates to a seal provided on sacks and bags, preferably thermoplastic plastic sacks and bags, which is adapted to permit occluded or liberated gases or vapours to escape, and at the same time to prevent or at least hinder moisture to enter the sacks and bags from outside. The invention concerns also a method of providing such a seal.

According to the invention, there is provided a sack or bag, formed of a tube of <sup>substantially</sup> gas or vapour-impermeable synthetic thermoplastic material an open end of which is provided with a seal comprising a capping strip folded along a fold line to present two flaps, the capping strip being positioned over the two walls of the open end of the sack or bag with each flap on its respective side of the sack or bag and sealed to the exterior of its respective side of the sack or bag by an external sealing line, wherein there is also provided an internal sealing line spaced from the fold line, said internal sealing line extending across and sealing the entire width of the open sack or bag apart from at least one interruption point along its length at which point the two walls of the sack or bag are not sealed together whereby any gases or vapours inside the sack or bag can escape only through the interruption point(s).

It is to be seen that there is a minimum of three sealing lines, namely an interrupted internal one between the internal sides of the sack or bag and two external ones, each external one being between the outside of the sack or bag and its adjacent flap of the capping strip.

Occluded or liberated gases and vapours inside the sack or bag can escape from the sack or bag between the walls of the sack or bag at the point of interruption of the seal, and by moving transversely along the channel space between the fold line of the capping strip and the internal sealing line to



escape at the free ends of the capping strip. The caliper of the sack or bag wall and the dimensions of the interrupted portion will, inter alia, determine the pressure at which occluded or liberated gases and vapours will escape.

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~~The tube forming the sack or bag is preferably a tube of a thermoplastic synthetic plastic material.~~

If desired, one or both of the external sealing lines may also be interrupted at one or more points along their length, to permit the gases or vapours to escape.

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A seal according to the invention may be provided for the closure of one or both ends of a sack or bag.

The internal sealing line should extend along the entire width of the open end closed thereby, with the exception of the interrupted portion or portions.

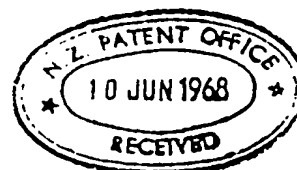
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The capping strip may consist of any suitable material. Preferably it consists of a heat sealable material, such as a suitable synthetic thermoplastic material. The sealing lines may then be lines of heat sealing, which may be brought about by any suitable heat sealing apparatus, such as a rotary type sealing apparatus.

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In practice, the spacing between the internal sealing lines and the fold line of the capping strip should be relatively small. In fact, if the spacing is too large, it is not impossible that moisture may enter the channel space defined and eventually the sack or bag. Therefore, it is preferred that the spacing be small, of the order of  $1/8$

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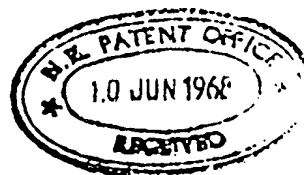
inch. The spacing must only be large enough to permit gas and vapour to escape that way.

According to the invention, the interruptions in the internal sealing line may be of such dimensions as to permit gas or vapour to escape at a <sup>predetermined rate</sup> ~~desired pressure~~. It has been found that interruptions of a length of the order of 0.3 - 0.8 inches give favourable results in practice.

Preferable the interruptions may have a length of about 0.5 inch. It should be understood that the larger the interruptions, the lower the pressure will be at which gases or vapours will escape.

Although a sack or bag may be provided with an internal sealing line having a single interruption, it is preferred to provide two spaced interruptions, one in the proximity of either end of the internal sealing line. For example, in a bag having a width of about 21 inches, the interruptions may be provided about 3 inches from either side. This arrangement has specific practical advantages, particularly that the sack will not seriously be weakened along the sealing line by the interruptions, if the latter are located in the proximity of the ends of the internal sealing line where the forces of strain or impact acting upon the seal are relatively small.

According to a further feature of the invention, those areas of the sack or bag walls facing each other at a point of interruption, may be coated with a substance which has no adherence to itself, so that the walls will open



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relatively easily to permit gasses or vapours to escape. It has been found that the substance with which the wall areas may be coated, may conveniently be printing ink of the type which is normally used for printing on synthetic plastic material, such as polythene or polyvinylchloride. For example the printing ink commercially available as "Coate's Briteflex Flexo" gives favourable results in practice.

Alternatively, the areas may be coated with a substance having a certain degree of adherence to itself or tackiness, so that the walls will adhere to one another and will open only when the pressure inside the sack or bag reaches a pre-determined value.

*Amended*  
The invention extends also to a method of producing a seal across the open end of a tube of gas or <sup>substantially</sup> vapour-impermeable synthetic thermoplastic material to form a sack or bag, which comprises the steps of positioning a longitudinally folded capping strip over the open end of the tube forming the sack or bag, so that each flap of the capping strip is positioned at its respective side of the sack or bag, and sealing the walls of the tube forming the sack or bag and the capping strip together respectively across the open end, said sealing comprising effecting two external sealing lines sealing the outside of the walls to the two flaps, and an internal sealing line between the inner walls of the sack or bag which internal sealing line is interrupted at one or more points, whereby any gases or vapours inside the sack or bag are able to escape only through the interruption point(s).



The capping strip may, as already indicated, advantageously be a strip of heat sealable material, e.g. of suitable synthetic thermoplastic material, so that the sealing may be brought about by heat sealing.

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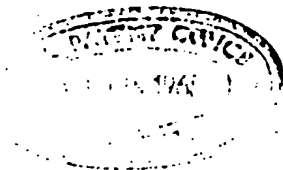
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The internal sealing line may conveniently be interrupted by positioning a barrier material between the walls of the sack or bag, ~~or between the walls and the flaps of the capping strip~~, at the point where the interruption is required, the barrier material being adapted to prevent the interfaces of the walls of the sack or bag from being sealed together. The barrier material may be positioned between the walls of the sack or bag, and then the barrier material should be incompatible with the material of the sack or bag, (i.e. 120 to 240°C) even at elevated temperatures, and should be adapted to remain in position during the sealing process. The term "incompatible" when used in this context should be interpreted to mean that the barrier material will not fuse with the material of the sack or bag on the normal contact surfaces, under sealing conditions. In one embodiment, the barrier material may comprise a finely divided solid phase stabilised in a liquid carrier phase.

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In practice, it has been found that certain types of printing ink can be used as the barrier material with favourable results, such as printing ink of the type normally used for printing on synthetic plastic material. For example, the ink which is commercially available under the trade name "Coate's Briteflex Flexo" has been found to give favourable results in practice. Nail varnish or certain paints may also



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be used as a barrier material. Alternatively, the barrier material may also be a strip of incompatible material, such as aluminium foil, pressure sensitive cellulose adhesive tape, and the like.

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In an alternative way, the barrier material may be positioned between the walls of the sack or bag and the flaps of the capping strip, and may then be adapted to serve as an insulating material to prevent the heat sealing of the interfaces of the sack or bag. In this case, the barrier material may comprise a compatible synthetic plastic material. The term "compatible" when used in this context, should be interpreted to mean a material which will adhere to or fuse with the material of the sack or bag and the capping strip under sealing conditions. Thus a "compatible" material would for example be the same synthetic plastic material as the material of the sack or bag and the capping strip.

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In one embodiment, the compatible synthetic plastic material may be applied to the walls of the sack or bag in molten state and is permitted to solidify on the walls. The plastic material may thus be a so-called hot-melt material.

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The thickness of the barrier material provided between the walls of the sack or bag and the flaps of the capping strip, should be sufficient to prevent the heat from reaching the interfaces of the walls of the sack or bag to seal them together.

As indicated above, the interruptions may have a length of the order of 0.3 - 0.8 inches. Furthermore, two





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spaced interruptions may be provided, one in the proximity of either end of the internal sealing line. The interruptions may be provided at those points where the forces of strain or impact acting upon the internal sealing line, are relatively small.

It should be understood that the interruptions in the internal sealing line may be brought about in any other suitable manner.

The invention and the manner in which it may be carried out in practice will now be described by way of example, with reference to the accompanying drawings.

In the drawings,

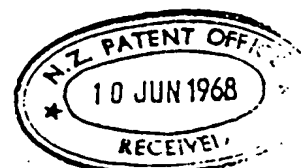
Figure 1 is a diagrammatic representation of the open end of a plastic sack;

Figure 2 is a diagrammatic front view of the sack, embodying the seal according to the invention;

Figures 3 and 4 are diagrammatic cross-sectional views of part of the sack and capping strip, taken along line A-A in Figure 2, but prior to sealing and illustrating two different applications of a barrier material;

Figure 5 is a diagrammatic cross-sectional view of part of the sack and capping strip corresponding to Figures 3 and 4, but after sealing;

Figures 6 and 7 are diagrammatic vertical sections of part of the sack and capping strip, taken along line B-B in Figure 2, but prior to sealing and illustrating two different applications of a barrier material in the same manner



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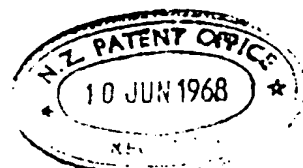
as in Figures 3 and 4; and

Figure 8 is a diagrammatic vertical section of part of the sack and capping strip corresponding to Figures 6 and 7, but after sealing.

5 The drawings illustrate diagrammatically and by way of example, two ways in which a seal according to the invention may be provided at the open end of a plastic sack.

10 Referring to the drawings, the walls 12, 14 of the open end of a sack generally indicated as 10 are provided with strips 16 of a barrier material. The barrier material is applied between the interfaces of the walls 12, 14 and is incompatible printing ink of the type normally used for printing on synthetic plastic material, e.g. the printing ink commercially available under the trade name "Coate's Briteflex Flexo", in the embodiments illustrated in Figures 3 and 6. It will be appreciated that the barrier material need be applied only on one wall 14. In the embodiments illustrated in Figures 4 and 7, the barrier material is applied to the external faces of the walls 12, 14 and is a compatible hot-melt synthetic plastic material. In this case, the barrier material should be applied to the external faces of both walls 12, 14. The strips 16 are about 0.3 - 0.8 inches in width, preferably about 0.5 inches, and are located towards the sides of the sack 10.

15 A longitudinally folded capping strip 18, presenting a fold line 19 and flaps 18a, 18b is positioned over the walls 12, 14. An internal sealing line as shown at 20, and external sealing lines as shown at 23 are provided respectively

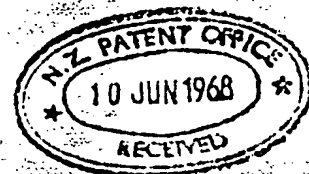


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between the walls 12, 14 and along the capping strip 18 by heat sealing. The sealing lines 20, 23 are spaced from the fold line 19 of the capping strip 18, to define a channel space 22.

5           The barrier material strips 16 prevent the walls 12, 14 to be sealed together at those points, and thus provide two interruptions 17 in the sealing line 20. The interruptions 17 occur in the following manner: In the embodiment shown in Figures 3 and 6, the barrier material is incompatible with 10 the material of the sack, and due to its physical presence prevents the walls 12, 14 to be sealed together at these points. In the embodiment shown in Figures 4 and 7, the barrier material is compatible with the material of the sack and the capping strip and thus permits the walls 12, 14 to be sealed to the 15 capping strip flaps 18a, 18b. However, it takes up so much of the heat of sealing, that it serves as an insulating material to prevent enough heat from reaching the interfaces of the walls 12, 14 to seal them together.

20           Occluded gases or vapours in the sack 10 are permitted to escape by passing out through the interruptions 17, and by moving transversely along the channel space 22 to escape at the free ends 24, 26 of the capping strip 18. Due to the small dimensions of the channel space 22 and the interruptions 17, and due to the length of the channel space 25 22, moisture is prevented or at least hindered to enter into the sack 10.



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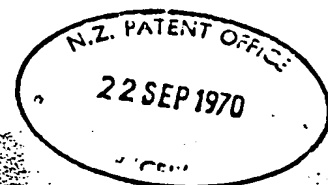
What we claim is:

substantially

1. A sack or bag, formed of a tube of gas or vapour-impermeable synthetic thermoplastic material an open end of which is provided with a seal comprising a capping strip folded along a fold line to present two flaps, the capping strip being positioned over the two walls of the open end of the sack or bag with each flap on its respective side of the sack or bag and sealed to the exterior of its respective side of the sack or bag by an external sealing line, wherein there is also provided an internal sealing line spaced from the fold line, said internal sealing line extending across and sealing the entire width of the open sack or bag apart from at least one interruption point along its length at which point the two walls of the sack or bag are not sealed together whereby any gases or vapours inside the sack or bag can escape only through the interruption point(s).

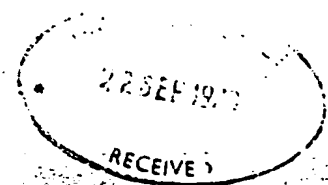
2. A plastics sack or bag according to claim 1, in which the capping strip consists of a heat sealable material, and in which the sealing lines are lines of heat sealing.

3. A plastics sack or bag according to claim 1 or 2, in which the spacing between the internal sealing line and fold line of the capping strip is substantially 1/8 inch.



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4. A plastic sack or bag according to any one of the preceding claims, in which the interruptions in the internal sealing line are of such dimensions as to permit gas or vapour to escape at a predetermined rate.
5. A plastic sack or bag according to any of the preceding claims, in which the interruptions have a length of 0.3 - 0.8 inches.
6. A plastic sack or bag according to any one of the preceding claims, in which the internal sealing line has two spaced interruptions, one in the proximity of either end of the internal sealing line.
7. A plastic sack or bag according to claim 6, in which the interruptions are provided at those points where the forces of strain or impact acting upon the internal sealing line are relatively small.
8. A plastic sack or bag according to any one of the preceding claims, in which those areas of the sack or bag walls facing each other at a point of interruption, are coated with a substance which has no adherence to itself, so that the walls will open relatively easily to permit gases or vapours to escape.
9. A plastic sack or bag according to claim 8, in which the substance with which the wall areas is coated, is



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printing ink of the type which is normally used on synthetic plastic materials.

10. A plastics sack or bag according to any one of claims 1 to 7, in which those areas of the sack or bag walls facing each other at a point of interruption, are coated with a substance having a certain degree of adherence to itself or tackiness, so that the walls will adhere to one another and will open when the pressure inside the sack or bag reaches a predetermined value.

11. A plastics sack or bag which is provided with a seal according to any one of the preceding claims, at both ends.

12. A plastics sack or bag substantially as described and illustrated herein.

13. A method of producing a seal across the open end of a substantially tube of gas or vapour-impermeable synthetic thermoplastic material to form a sack or bag, which comprises the steps of positioning a longitudinally folded capping strip over the open end of the tube forming the sack or bag, so that each flap of the capping strip is positioned at its respective side of the sack or bag, and sealing the walls of the tube forming the sack or bag, and the capping strip together respectively across the open end, said sealing

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comprising effecting two external sealing lines sealing the outside of the walls to the two flaps, and an internal sealing line between the inner walls of the sack or bag which internal sealing line is interrupted at one or more points, whereby any gases or vapours inside the sack or bag are able to escape only through the interruption point(s).

14. A method according to claim 13, in which the capping strip is a strip of heat sealable material, and in which the sealing is brought about by heat sealing.

15. A method according to claim 13, or 14, in which the internal sealing line is interrupted by positioning a barrier material between the walls of the sack or bag, \_\_\_\_\_ at the point or points where the interruption is required, the barrier material being adapted to prevent the interfaces of the walls of the sack or bag from being sealed together.

16. A method according to claim 15, in which the barrier material, which is positioned between the walls of the sack or bag, is incompatible with the material of the sack or bag, even at temperatures of 120 to 240°C, and adapted to remain in position during the sealing process.

17. A method according to claim 15, in which the barrier material comprises a finely divided solid phase stabilised in a liquid carrier phase.

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18. A method according to claim 17, in which the barrier material is printing ink of the type normally used for printing on synthetic plastic material.

19. A method according to claim 15, in which the barrier material is positioned between the external faces of the walls of the sack or bag and the flaps of the capping strip, and is adapted to serve as an insulating material to prevent the heat from sealing the walls of the sack or bag together.

20. A method according to claim 19, in which the barrier material comprises a compatible synthetic plastic material.

21. A method according to claim 20, in which the compatible synthetic plastic material is applied to the walls of the sack or bag in molten state and is permitted to solidify on the walls.

22. A method according to any one of claims 13 to 21, in which the interruptions provided have a length of 0.3 - 0.9 inches.

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23. A method according to any one of claims 13 to 22, in which two spaced interruptions are provided, one in the proximity of either end of the internal sealing lines.

24. A method according to claim 23, in which the interruptions are provided at those points where the forces of strain or impact acting upon the internal sealing line, are relatively small.

25. A method of producing a seal across the open end of a plastic sack or bag, substantially as described herein.

26. A plastic sack or bag whenever provided with a seal by the method according to any one of claims 13 to 25.



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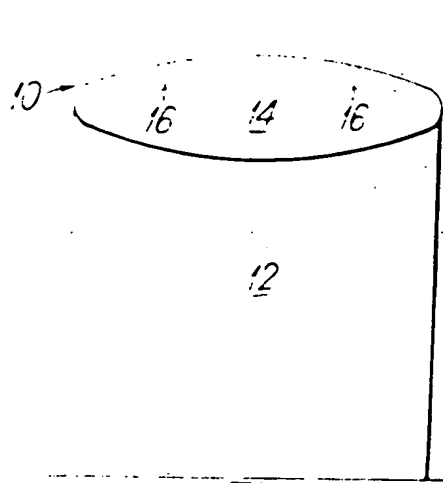


Fig. 1

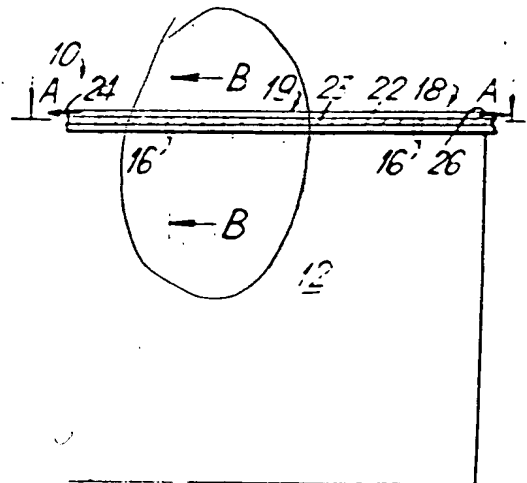


Fig. 2

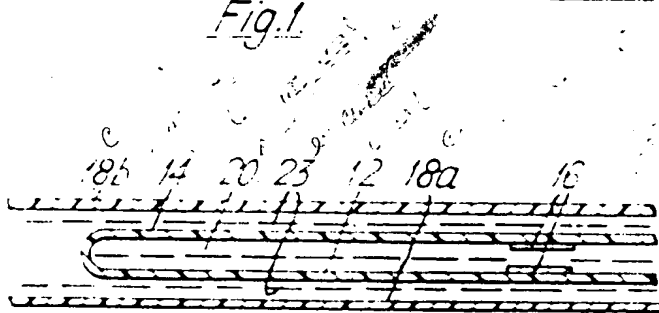


Fig. 3

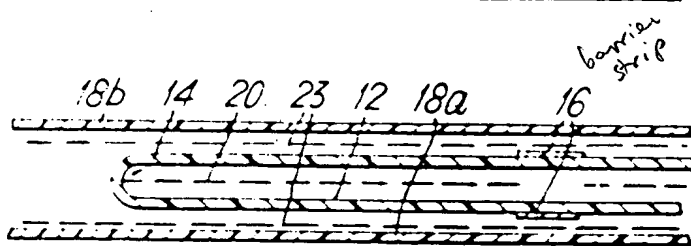


Fig. 4

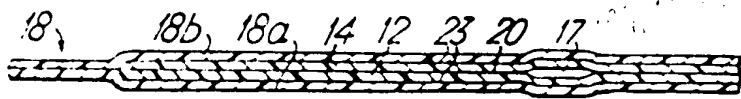


Fig. 5

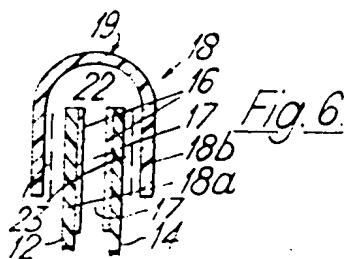


Fig. 6

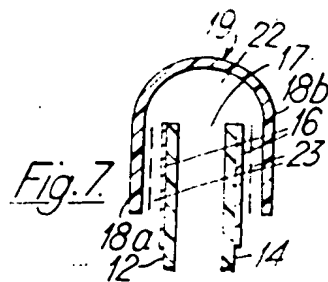


Fig. 7

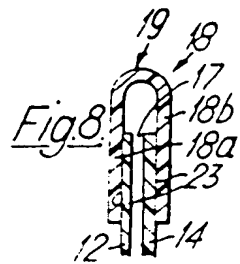


Fig. 8

From (Fig. 1) to (Fig. 8)